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PATENT AND TECHNICAL TRANSLATION

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ACCREDITED BY AMERICAN TRANSLATORS ASSOCIATION
• GERMAN AND FRENCH TO ENGLISH
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DECLARATION

The undersigned, Olaf Bexhoeft, hereby states that he is well acquainted with both the English and German languages and that the attached is a true translation to the best of his knowledge and ability of the German text of PCT/EP02/14702, filed 12/21/2002 and published 07/31/2003 under No. WO 03/062709 A1, and of eleven (11) amended claims.

The undersigned further declares that the above statement is true; and further, that this statement was made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or document or any patent resulting therefrom.

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Method for Producing a Holding Element

The invention relates to a holding element in an edge area of a molded body, as well as to a method for producing it, wherein the molded body consisting of a brittle material is inserted into a molding tool, wherein a material well in the edge area of the molded body is formed by means of the molding tool, wherein the material well is at least partially filled by a plastic material, and thereafter the molded body with the holding element formed on it is taken out of the molding tool.

A holding element for a cooking surface is known from DE 197 03 543, wherein the cooking surface is embodied as a molded body made of a brittle material. In this case the holding element consists of a duromeric material, which is fiberglass-reinforced for improving its characteristic material values.

A holder is described in DE 198 15 371 A1, which is formed on a molded body by means of an injection-molding process. The material used is a thermoplastic material. In this method the plastic material shrinks greatly during cooling. So that no impermissibly high tensions are caused in the molded body, a shrinkage-absorbing element is used. This is inserted as a separate part into the mold during the injection-molding process and, when the workpiece is finished, is integrated into the holding element.

A method for producing extrusion-coated glass panes is known from EP 98 112 258 A1.

It is the object of the invention to create a method of the type mentioned at the outset, by means of which a holding element can be efficiently formed on a brittle molded body.

This object is attained in that the molded body is

maintained in the molding tool by means of a clamping element, wherein a section of the material well is delimited by means of the clamping element, that a sealing element is placed on the molded body in a transition area between the material well and the clamping element, and that the plastic material is placed into the material well and sets in the course of an extrusion process.

In accordance with the invention, an extrusion process is employed for producing the holding element. In the course of this a clamping element (also called a "pressure pad") is employed for fixing the molded body in place. The sealing element guarantees that the material well is securely sealed. It is possible in the course of this to select the pressure applied to the molded body via the clamping element in such a way that there is no danger of the material breaking.

Excess pressures can occur at times during the extrusion process. In the course of this, excess plastic material escapes from the area between the clamping element and the molded body. The occurrence of excess pressures can be prevented by employing the sealing element.

In accordance with a preferred embodiment variation of the invention it is provided that an adhesive tape is glued as the sealing element to the molded body. The adhesive tape can be applied in an easy manner. In this case the adhesive surface can be designed in such a way that it simultaneously takes over a sealing function.

If it is provided that the sealing element has an elastically and/or plastically deformable effective layer which is deformed by means of the clamping element, it is possible to compensate irregularities close to the surface of the molded body by means of the sealing element, which is of particular interest

should the molded body have a structured surface.

It is for example possible to dependably seal structured, in particular napped surfaces, as with molded bodies consisting of glass-ceramic material.

A sufficiently dependable sealing can be achieved in particular if it is provided that the effective layer has a Shore hardness in the range between 40 and 80, preferably 50 to 70, Shore A, and/or that the thickness of the material of the sealing element is selected to lie in the range of 0.1 to 0.5 mm, preferably in the range of 0.2 to 0.4 mm.

Good sealing can be achieved in particular if it is provided that the sealing element is partially displaced into the area of the material well. In this case it is possible to assure generous tolerances regarding the exactness of the application of the sealing element.

In accordance with the invention it can be provided that the material well is filled with a fiberglass-reinforced duromeric material. The holding element produced by means of this material is particularly suited for framing cooking surfaces which are temperature-resistant and dimensionally stable and scratch-proof.

Following the removal of the molded body from the molding tool, the sealing element can be removed, depending on the product requirements, or can remain on the molded body. If it remains, it is necessary to select the properties of the material in such a way that they meet the use requirements of the molded body.

It is possible to achieve good manufacturing results in particular if it is provided that the width of the sealing element (extension of the sealing element in the direction of the connecting plane of the sealing element with the molded body) is selected to lie within the range of 10 to 25 mm, preferably in the

range of 12 to 18 mm.

The sealing element must also be capable of assuredly absorbing the manufacturing conditions in the course of the manufacturing process. It is therefore possible in accordance with the invention to provide that the sealing element has a temperature resistance greater than 160°C. The danger of excess pressure is prevented in particular if it is provided that the distance of the sealing element from the edge of the molded body is selected to lie in the range between 0 and 10 mm, preferably in the range between 1 and 5 mm.

The holding element can be embodied in the shape of a frame, for example, and can completely surround the molded body. In that case it is preferably provided that the sealing element is placed extending around the molded body.

The invention will be explained in greater detail in what follows by means of an exemplary embodiment represented in the drawings. Shown are in:

Fig. 1, a fastening arrangement with a holding element and a molded body in a lateral and partial view, and

Fig. 2, the fastening arrangement represented in Fig. 1 in a manufacturing tool in a lateral view and in section.

A molded body 30, namely a cooking surface, is represented in Fig. 1. The molded body 30 consists of a brittle material, such as glass, a glass-ceramic or ceramic material. It is embodied in the form of a plate, which is surrounded by a holding element 10 on its edge. Here, the holding element 10 encloses the edge all around. To this end, a leg 14 of the holding element 10 rests on the top 31 of the molded body. A support element 16 extends parallel with the leg 14, which supports the molded body from below and is placed on its underside 32. The leg 14 is

connected with the support element 16 by a strip 15. The strip 15 covers the outer edge area of the molded body 30. The strip 15 has been extended by means of at least one fastening section 17. The fastening section 17 projects well past the support element 16.

As can be seen in Fig. 1, the support element 16 is supported in a partial area via a sealing element 20 on the underside 32 of the molded body 30. The sealing element 20 is embodied as an adhesive tape. It has an adhesive layer 22, by means of which it is glued to the underside 32 of the molded body. An effective layer adjoins the adhesive layer 22 and is made of an elastically yielding material. The function of the sealing element 20 will be explained in greater detail later.

The leg 14 of the holding element 20 makes a transition into a protrusion 12 via a support section 11. The protrusion 12 releases a horizontal section of the support section, which results in a sealing receptacle 13. In the installed state the protrusions 12 is supported on a work plate. The portion of the arrangement located in the area of the strip 15 and the fastening section 17 has been inserted into a recess of the work plate. A seal has been inserted into the sealing receptacle 13 for sealing the surface of the work plate against the recess.

The process for the manufacture of the molded body 30 with the holding element 10 formed on it will be described in what follows, making reference to Fig. 2.

A mold with two partial work molds 40.1 and 40.2 is represented in Fig. 2. The lower partial work mold 40.2 has an adjusting body 40.3. The latter can be displaced in the vertical direction by means of guides. The adjusting body 40.3 can be clamped by means of clamping elements 40.4 in the direction of its

displacement degree of freedom. For forming the holding element 10, first the sealing element designed as an adhesive tape is glued to the underside 32 of the molded body 30. Subsequently the molded body 30 is placed into one of the two partial work molds 40.1, 40.2. Thereafter, the second partial work mold 40.1, 40.2 is placed on it and the mold is closed. Subsequently the adjusting body 40.3 is linearly displaced until it is seated with its adjusting face against the underside 32 of the molded body 30. Together with the two partial work molds 40.1 and 40.2, the adjusting body 40.3 encloses a material well located in the edge area of the molded body 30. The sealing element 20 extends into the area of the material well. At the same time the sealing element 20 also projects so far inward that the adjusting body 40.3 can be supported flush on it. This results in a seal. The manufacture of the holding element is performed by means of an extrusion process. To this end, a thermosetting material, for example raw SMC material, is placed into the material well. Following the placement of this material and the closing of the two partial work molds 40.1, 40.2, a pressure is built up in the mold which in the end causes the shaping of the holding element 10. The sealing element 20 prevents material from being pushed by excess pressure into the area between the underside 32 of the mold body 30 and the contact surface of the adjusting body 40.3. This effect then causes breakage of the brittle molded body 30 if an impermissible large amount of plastic material is pressed out. The sealing element 20 prevents this excess pressure. A certain amount of unevenness of the molded body 30 in the area of its underside 32 can be compensated by means of the effective layer used for the sealing element 20, which is embodied to be elastically yielding. In particular, it is possible to even out

structured, for example napped undersides 32 of the molded body. Undersides 32 structured in this way are used in cooking surfaces, for example.

Following a typical setting time of 2 to 3 minutes, the mold is opened and the finished part can be removed. The adhesive tape is partially pressed in during the manufacturing process. The projecting, still visible portion can either be removed thereafter, or can possibly also be left on the underside 32. In this case the outlay for finishing is clearly reduced. However, care should be taken that the sealing element 20 has the required characteristic material values in order to prevent waste or a visual interference. In accordance with this it might be required that the sealing element 20 possibly have a definite transparency, temperature resistance or dimension.